IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF ILLINOIS

YONG JUAN ZHAO, on behalf of her minor son, Steven Zhao, **Plaintiff,** **v.** **UNITED STATES OF AMERICA,** **Defendant.**	**Case No. 17-454-NJR-GCS**

MEMORANDUM AND ORDER

ROSENSTENGEL, Chief Judge:

Yong Juan "Maggie" Zhao filed this medical malpractice action under the Federal Tort Claims Act ("FTCA") on behalf of her young son, Steven Zhao.[1] Mrs. Zhao alleges that negligent care by her physician, Dr. Paul Cruz, during her pregnancy with Steven resulted in shoulder dystocia and permanent injury to Steven's right brachial plexus.

The Court has subject matter jurisdiction over this action pursuant to 28 U.S.C. §§ 1346(b) and 2674. At the time of his treatment of Mrs. Zhao, Dr. Cruz was an employee of Christopher Greater Area Rural Health Planning Corporation ("CRHPC"), a federally supported grant clinic, and thus he is deemed an employee of the United States Public Health Service in accordance with 42 U.S.C. § 233(g). Venue is uncontested and proper as CRHPC operates within, and Dr. Cruz and the Zhao family reside in, the Southern

[1] In her Complaint (Doc. 1), Mrs. Zhao also sought damages on her own behalf relating to the labor and delivery of her son. Those claims were dismissed shortly before trial, however, and thus the Court only considers the negligence claim Mrs. Zhao brought on behalf of Steven. At the time of trial in April 2019, Steven was four years old. He recently turned five.

District of Illinois. The alleged negligence giving rise to Mrs. Zhao's claim also occurred in the Southern District of Illinois. And it is likewise uncontested that Mrs. Zhao exhausted her administrative remedies with the United States Department of Health and Human Services by submitting an administrative tort claim seeking damages in the amount of $30,000,000.

The Court conducted a bench trial from April 9-10, 2019, and now makes the following findings of fact and conclusions of law.

FACTS

Parties

Dr. Paul Cruz is a now-retired obstetrician/gynecologist ("OB/GYN") who obtained his Illinois medical license in 1988 and practiced for twenty-eight years (Doc. 51, pp. 516-17). He was born in New York and attended school, including medical school, in Puerto Rico (*Id.*). As he did at CRHPC, throughout his career Dr. Cruz focused his obstetrical practice on treating mainly underserved, Medicaid-dependent women (*Id.* at pp. 518-19). Ms. Zhao was not a patient of Dr. Cruz until her pregnancy with Steven (Doc. 46, p. 48).

Steven Zhao is the fourth child born to Maggie and Zhi Qiang Zhao (*Id.* at p. 351). Steven has three older brothers: Kevin, Alex, and Benjamin (*Id.* at pp. 351-52). The parties stipulated that Mrs. Zhao gave birth to the three older boys via vaginal delivery with no complications (Doc. 41). Her second son, Alex, was a very large baby, weighing eleven pounds, twelve ounces (Ex. 10, p. 4). Mrs. Zhao later estimated that her labor with Alex lasted six hours, but she was unfamiliar with what the "second stage of labor" denoted

(Doc. 48, pp. 360, 386). To effect Alex's delivery, Mrs. Zhao had to give birth seated on the edge of a chair bending her chest toward her knees while a doctor or nurse on each side helped hold her up, another doctor pressed on her abdomen, and another doctor was underneath her to get the baby out (*Id.* at p. 360). Mrs. Zhao testified that she told Dr. Cruz about the maneuvers required for Alex's delivery, but neither he nor anyone in his office asked her how long her labor with Alex lasted (*Id.*).

Mrs. Zhao was thirty-five years old when Steven was born (Ex. 18, p. 2). Her pregnancy with Steven was unplanned (*Id.* at p. 354). After Steven's birth, Mrs. Zhao underwent a fallopian tube occlusion procedure for the purpose of permanent birth control, performed by Dr. Cruz (*Id.*). That procedure failed, so Mrs. Zhao chose an intrauterine device ("IUD") to prevent future pregnancies (*Id.* at pp. 354-55; Doc. 51, pp. 548-50).[2]

Mrs. Zhao and her husband are first generation Chinese immigrants and permanent residents of the United States. (Doc. 48, pp. 351, 378). They operate a Chinese buffet restaurant attached to a mall in Marion, Illinois, where Mrs. Zhao estimates she now works forty hours per week (*Id.* at p. 351). The buffet is the Zhaos' only source of income (*Id.* at p. 379). During Mrs. Zhao's pregnancy with Steven, the business was doing well enough for Mrs. Zhao to hire someone to help her work at the buffet, but, because the adjacent mall has closed down, business has declined (*Id.* at pp. 379, 389).

[2] As the Court noted during trial (Doc. 46, p. 568), it is difficult to understand why a vasectomy for Mr. Zhao was never suggested as a method of permanent birth control, given the rigors of Mrs. Zhao's labors, deliveries, and failed tubal occlusion, and the fact that the Zhaos resolutely did not want another pregnancy. Nonetheless, what matters here is that Mrs. Zhao was determined to proceed with some form of successful permanent sterilization following Steven's birth.

The Zhaos do not speak or understand English (*Id.* at pp. 390, 401; Doc. 51, p. 434). Mrs. Zhao required a translator to accompany her to all obstetrical visits and to the hospital (Doc. 51, p. 438, 520). The Zhao family speaks Chinese at home, as do the children (Doc. 48, p. 351).

Steven briefly attended the trial in this case and was observed to be a typically rambunctious, taciturn four-year-old. Steven's right arm is obviously damaged. Steven can speak English (Ex. 8, pp. 20, 25). He currently attends an early childhood/pre-kindergarten program where he receives special education services because his right arm injury limits his ability to otherwise benefit from or participate in the classroom. (Doc. 51, p. 482). Additional impacts and specifics of Steven's disability are discussed below.

When he was born and his head delivered—after two attempts to vacuum extract his head – Steven's shoulders remained stuck inside his mother for nine minutes (Doc. 47, pp. 130, 152). Steven weighed eleven pounds, six ounces when he was born on June 15, 2014 (Doc. 46, p. 95).

Prenatal Care

Mrs. Zhao's first prenatal visit with Dr. Cruz occurred December 13, 2013. At that visit, Mrs. Zhao communicated a number of things to Dr. Cruz: she was not happy with this unplanned pregnancy; she wanted to be sterilized; and, in the event she needed a Cesarean section for delivery of the baby, she wanted a tubal ligation performed at the time of the Cesarean section (Doc. 46, p. 79-80). Her desire for tubal ligation following a Cesarean section is charted on the first page of Dr. Cruz's medical records (Ex. 10, p. 1).

Dr. Cruz classified Mrs. Zhao's pregnancy as "high risk" because at the time thirty-five years of age was accepted as "advanced" maternal age (Doc. 51, pp. 523-24).

As a matter of course, Dr. Cruz and his staff asked patients about previous pregnancies in order to gather information pertinent to management of the current pregnancy (Doc. 46, p. 44). In Mrs. Zhao's case, Dr. Cruz's nurse practitioner noted the date and state of Mrs. Zhao's three previous live births; that the births were vaginal; and the weight of the babies (Ex. 10, p. 4). The birth weight of Mrs. Zhao's second son, Alex, was noted to be 11.12 pounds (*Id.*).[3]

Dr. Cruz did not ask Mrs. Zhao—nor did he know if anyone at his office had asked—details or anomalies of her previous pregnancies, labors, deliveries, or postpartum management (Doc. 46, pp. 48-49). For example, Dr. Cruz did not know or find out at how many weeks Mrs. Zhao delivered her previous babies (*Id.* at p. 49). He did not know or find out in which hospitals or in which cities Mrs. Zhao had previously delivered, nor did he seek records from those facilities (*Id.* at p. 64). He did not know or investigate the length of the second stage of labor of any of Mrs. Zhao's previous deliveries—even the delivery of eleven-pound, twelve-ounce Alex (*Id.* at pp. 55-56). The section of Dr. Cruz's prenatal record for "comments/complications" of Mrs. Zhao's previous births was blank—Dr. Cruz assumed that meant there had been no complications (*Id.* at p. 49). Dr. Cruz also assumed that the blank sections for gestational age, length of labor, and anesthesia meant Mrs. Zhao had not known when asked; he

[3] There is some discrepancy in the record as to Alex's birthweight. There is no question, however, that he was a large, macrosomic baby, weighing at minimum ten pounds, twelve ounces.

again assumed she had been asked (*Id.* at pp. 50-52). There was no satisfactory explanation for why he assumed that blank spaces on one section of the form denoted "there were none" (complications) and blank spaces on another section of the same form denoted "patient didn't know" (*Id.* at p. 52).

Additional information regarding Mrs. Zhao's previous pregnancies, labors, deliveries, and postpartum healing would admittedly have been important with respect to managing Mrs. Zhao's pregnancy and delivery of Steven (*Id.* at p. 53). For example, a previous lengthy labor would indicate the previous labor had been extended or difficult (*Id.* at pp. 53-54). It would have alerted Dr. Cruz to the probability of another extended or difficult labor, particularly a prolonged second stage of labor (*Id.* at p. 56). The main cause of a prolonged second stage of labor is cephalopelvic disproportion—discrepancy between the size of the baby's head and the maternal pelvis (*Id.*).

Despite minimal knowledge of her labors and deliveries, Dr. Cruz was confident in Mrs. Zhao's "proven pelvis" because she had previously given birth to an eleven-plus-pound baby (*Id.* at p. 57). Dr. Cruz admitted, however, that Mrs. Zhao's delivery of a large baby with no complications in the past did not preclude the possibility that the labor and delivery had been lengthy or difficult (*Id.* at p. 62). Even with Mrs. Zhao's "proven pelvis," there was no way to determine whether she experienced cephalopelvic disproportion during her previous deliveries, because there is no such history recorded in Dr. Cruz's records, and her past records were not obtained (*Id.* at p. 63). In other words, there very well might have been cephalopelvic disproportion during Alex's delivery, despite the fact he was delivered without permanent injury (*Id.* at p. 62).

A birthweight of eleven pounds, twelve ounces is "macrosomic." Dr. Cruz identified "macrosomia" as a birthweight over 4,000 grams—eight pounds, ten ounces (*Id.* at pp. 58-59).[4] Dr. Cruz knew Mrs. Zhao had a previous macrosomic birth (*Id.* at p. 67). He knew the information of a previous macrosomic birth was significant (*Id.*). And Dr. Cruz admitted that the previous macrosomic birth was material to management of Mrs. Zhao's pregnancy, labor, and delivery of Steven because a previous macrosomic baby increases the risk of a subsequent macrosomic baby (*Id.*).

A macrosomic baby means an increased risk of shoulder dystocia (*Id.* at p. 59). Shoulder dystocia is an absolute medical emergency occurring during delivery (*Id.* at p. 62). Simply put, the larger the baby, the broader the shoulders, the greater the likelihood the shoulders become trapped in the birth canal at delivery[5] (*Id.* at pp. 60-61). Because of the dire outcomes associated with shoulder dystocia, it is vital for the obstetrician to be aware of any presenting risk factor for macrosomia (*Id.*at p. 62). Macrosomia increases the probability of shoulder dystocia by at least fifteen percent (*Id.* at p. 59). The more the baby weighs, the more risk for shoulder dystocia (*Id.*). Birthweight in excess of 4,500 grams (nine pounds, fourteen ounces), for example, increases the risk of shoulder dystocia from 9.2 to 24 percent (Doc. 47, p. 307). The risks go up and up from there (Doc. 46, p. 61).

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[4] Dr. Cruz defined macrosomia as birthweight greater than 4,000 grams. The Government's liability expert, Dr. Robert Gherman, indicated that either 4,000 or 4,500 grams is the threshold for macrosomia (Doc. 47, p.215).

[5] Although Dr. Cruz described Mrs. Zhao as "medium to small," the Court observed her at trial, and she has a markedly petite frame (Doc. 46, p. 44). And, according to the medical records, she is five feet, two inches tall (Ex. 40, p. 102), and from the Court's perspective at or below normal weight.

So, at the earliest stages of Mrs. Zhao's prenatal care, based on her previous delivery of a macrosomic baby, Dr. Cruz knew Mrs. Zhao was at markedly greater risk of delivering another macrosomic baby, and Dr. Cruz knew that if Mrs. Zhao were to deliver another macrosomic baby, the risk of shoulder dystocia during delivery significantly increased (*Id.* at p. 67).

Dr. Cruz recognized that estimating fetal weight would be particularly important in this case given Mrs. Zhao's previous macrosomic birth (*Id.* at p. 84). To do so, Dr. Cruz employed a clinical method for estimating fetal weight he learned during residency from his department chairperson, Dr. Sicurenza (*Id.* at p. 85; Doc. 51, p. 517). This "Sicurenza method" is not recognized by the American College of Obstetricians & Gynecologists ("ACOG") or any professional medical body, nor is it published in any medical literature (Doc. 46, pp. 84-85). In fact, no medical expert in this case has heard of it. Dr. Cruz considers the method his own personal tool for estimating fetal weight (*Id.* at p. 88). The method involves adding measurements of the fundus and pelvis (*Id.* at p. 86).

Using his "Sicurenza method," Dr. Cruz estimated the birthweight would be eight pounds, one ounce, accurate to plus or minus one pound (*Id.* at p. 89). In other words, Dr. Cruz proceeded to Steven's delivery with the opinion that Steven would weigh between seven pounds, one ounce and nine pounds, one ounce at birth (*Id.*).

Dr. Cruz also recorded fundal height measurements, comparing them to the fetal gestational age (*Id.* at p. 91). When the fundal height measurement corresponds to the week of gestation, the baby is considered to be within average size parameters (*Id.* at pp. 91-92). If the fundal height varies from the gestational week by two centimeters or

more, an ultrasound is indicated to rule out macrosomia (*Id.*). For example, on May 22, 2014, at 36.6 weeks gestational age, Mrs. Zhao's fundal height measured thirty-six—no indication of mismatched size/gestational age (Ex. 41, p. 56).

On May 29, 2014, at 37.6 weeks gestational age, Mrs. Zhao's fundal height measurement was forty—more than a two-centimeter variance (*Id.*; Doc. 46, p. 93). Dr. Cruz did not order an ultrasound (*Id.*).

On June 12, 2014, at 39.6 weeks gestational age, the recorded fundal height was written over and is either "41" or "42" (Doc. 46, p. 97; Ex. 41, p. 56). Dr. Cruz agreed it could very well be a "42" and thus another discrepancy of two or more centimeters (Doc. 46, p.98). Dr. Cruz did not order an ultrasound (*Id.*).

On June 4, 2014, at 38.4 weeks gestation, Mrs. Zhao felt pressure and experienced contractions (Ex. 12, p. 2; Doc. 48, p. 363). She had also noticed, with alarm, part of her cervix protruding from her vagina (*Id.*). She presented to Memorial Hospital of Carbondale (*Id.*). During the exam to rule out labor, the hospital's OB/GYN noted the cervix was inflamed with a long tongue of tissue hanging out from the vagina (*Id.*). The doctor surmised that this cervical prolapse had been caused by a tear of the cervix during prior labor and delivery (*Id.*). Dr. Cruz agreed that the laceration and cervix prolapse was likely due to one of Mrs. Zhao's prior deliveries (Doc. 47, pp. 186-87). Dr. Cruz did not further inquire at that time into any particular difficulties during or resulting from Mrs. Zhao's previous deliveries, even into the delivery of eleven-pound, twelve-ounce Alex (*Id.* at p. 186).

At Mrs. Zhao's prenatal visit with Dr. Cruz on June 12, 2014, she was at thirty-nine weeks, six days gestation (Ex. 41, p. 56). Mrs. Zhao expressed concern to Dr. Cruz because her past three deliveries had all occurred before the due date (Doc. 48, p. 363). Because she was nearly forty weeks gestation, Dr. Cruz scheduled an induction of labor for June 19, 2014 (Doc. 51, pp. 530-31; Ex. 41, p. 56). At that June 12th visit, Dr. Cruz discussed the risk and benefits of induction, specifically that an induction carries a greater risk of Cesarean section (Doc. 51, p. 531). Dr. Cruz explained the risks of a Cesarean section to Mrs. Zhao, including bleeding, infection, trauma to the abdominal pelvic organs, and increased risk of maternal and fetal death (*Id.* at p. 532).

Mrs. Zhao and Dr. Cruz remembered their prenatal discussions about the possibility of Cesarean section differently. Dr. Cruz recalled both the June 12 discussion of Cesarean section risks and Mrs. Zhao's early term request for a tubal ligation at the time of delivery if she required a Cesarean section (*Id.*). He also recalled Mrs. Zhao, through her interpreter, telling him on multiple occasions that she wanted to avoid any kind of incision because she wanted to return to work as quickly as possible (*Id.* at p. 533). Unfortunately, Dr. Cruz never charted any such preferences in Mrs. Zhao's records.

Mrs. Zhao recalled asking Dr. Cruz about a Cesarean section, including suggesting and requesting the procedure, three times during her prenatal care (Doc. 48, p. 361). She asked or suggested a Cesarean section at her first visit when discussing her desire for tubal ligation (*Id.* at pp. 361-63). Then after her cervix prolapsed, she testified that she asked Dr. Cruz on more than occasion about the possibility of a Cesarean section before her labor began (*Id.*).

Labor and Delivery

Before her scheduled induction, Mrs. Zhao went into labor. On June 15, 2014, she arrived at Memorial Hospital of Carbondale already dilated to seven centimeters (Ex. 19, p. 1). She was past her due date, at forty weeks and two days gestation (*Id.*).

Crystal Tellor was Mrs. Zhao's primary labor and delivery nurse; she testified live at trial on behalf of the United States (Doc. 51, p. 410). Nurse Tellor frequently worked with Dr. Cruz, and Dr. Cruz described her as one of the best nurses in labor and delivery (Doc. 46, p.40). Sylvia Loh, Mrs. Zhao's interpreter who had accompanied her to prenatal visits, was present with Mrs. Zhao throughout labor and delivery (Doc. 48, p. 390).[6]

Nurse Tellor relied on an iPad for interpretation (Doc. 51, p. 437). To use the iPad interpreter, Nurse Tellor dialed a number, gave a brief description of the medical issue, and asked for a Mandarin Chinese speaker (*Id.*). Dr. Cruz testified he did not utilize the iPad for interpretation, and he has no memory of seeing one in the delivery room (Doc. 46, p. 47). The Labor and Delivery Flowsheet indicates that an iPad was present in the delivery room. (Ex. 15, p. 1; Doc. 51, p. 420). And Nurse Tellor testified that Ms. Loh would frequently speak over the iPad interpreter (Doc. 51, pp. 440-441).

When Mrs. Zhao was admitted, Dr. Cruz performed an additional procedure—a Leopold's Maneuver—to assess whether the baby was "big" or "normal size" (Doc. 46, p. 100; Doc. 51, pp. 533-34). Dr. Cruz's Leopold's maneuver findings told him the baby was "normal" size, eight or nine pounds, confirming his "Sicurenza" estimation of eight pounds one ounce, plus or minus one pound (Doc. 46, pp. 100-01; Doc. 51, p. 534).

[6] Ms. Loh's deposition testimony was admitted by the United States as an exhibit.

Nurse Tellor also performed a Leopold's maneuver on Mrs. Zhao (Doc. 51, p. 446). From her execution of the Leopold's maneuver, Nurse Tellor concluded that the baby would be large; heavier than eight pounds (*Id.*). Nurse Tellor did not convey her own findings to Dr. Cruz (*Id.* at p. 447). The Leopold exam did not give Nurse Tellor an exact estimate of the baby's weight; properly estimating the weight would have required an ultrasound (*Id.* at p. 448). Dr. Cruz did not order an ultrasound during labor, but—given her conclusion that the baby was larger than average—Nurse Tellor admitted she would not have been surprised if Dr. Cruz had ordered an ultrasound at that time (*Id.*).

Mrs. Zhao did not receive an epidural (Doc. 48, p. 397). She was given Nubain, a narcotic, for pain management during labor (Ex. 15, p. 2). She progressed to full dilation and began to push (Ex. 19, p. 1). Based on Mrs. Zhao's attempts to push with prompts through the iPad interpreter, it was not clear to Nurse Tellor whether the iPad interpreter was properly instructing Mrs. Zhao or whether Mrs. Zhao fully understood the interpreter (Doc. 51, p. 418). Nurse Tellor then tried to demonstrate what she was asking Mrs. Zhao to do (*Id.*).

Mrs. Zhao pushed for over an hour and a half (Ex. 19, p. 1). Ms. Loh, Mrs. Zhao's interpreter, relayed to Nurse Tellor that Mrs. Zhao was exhausted (Ex. 15, p. 4). At trial, Dr. Cruz admitted that the baby's extreme size was a likely cause of Mrs. Zhao's exhaustion (Doc. 46, p. 105).

Mrs. Zhao does not recall Dr. Cruz offering to perform a Cesarean section at any point (Doc. 48, p. 395). She says she asked the doctor for a Cesarean section when she

became too exhausted to push, but Dr. Cruz declined (*Id.* at p. 392). Dr. Cruz told her it was too late for the surgery (*Id.*).

On the other hand, according to Dr. Cruz and Nurse Tellor's recollection and recorded notes, Dr. Cruz did offer Mrs. Zhao a Cesarean section. After Mrs. Zhao struggled to push for approximately ten minutes, Dr. Cruz—though it is unclear through what method of interpretation—offered to assist vaginal delivery with the Mityvac vacuum machine (Doc. 51, p. 420; Ex. 15, p. 4). After describing the Mityvac, Dr. Cruz claims he offered Mrs. Zhao the option of a Cesarean section (Doc. 51, p. 420; Ex. 15, p. 5). Mrs. Zhao continued to struggle pushing, so three minutes later, Dr. Cruz relayed the risks and benefits of Cesarean section and Mityvac to Mrs. Zhao. (Doc. 51, pp. 420-21; Ex. 15, p. 5). He told her that the Mityvac extraction carried a risk of brain injury because the suction could damage vessels or bone structures of the baby's head (Doc. 46, p. 110). That was the only risk of vacuum delivery Dr. Cruz explained to Mrs. Zhao (*Id.*). The Labor and Delivery record indicates that Mrs. Zhao then agreed to Mityvac extraction to assist a vaginal birth (Ex. 15, p. 5).

The vacuum extractor uses suction pressure to attempt assisting delivery of the fetal head (Doc. 47, p. 129). According to Dr. Cruz, at the time he applied the vacuum extractor, the top of the baby's head, the vertex, appeared to be *close* to the pelvic outlet (Doc. 46, p. 115). Dr. Cruz testified, however, that the baby's head was in fact *not* at the pelvic outlet (*Id.*). Nurse Tellor testified that at the time Dr. Cruz applied the vacuum, the baby's head was not crowning (Doc. 51, pp. 441-42). Dr. Cruz also acknowledged that when a mother has been pushing for as long as an hour and a half, the baby's head can

elongate and mold into the pelvic cavity and the scalp of the baby's head might swell and appear to be further descended than the baby's skull is actually descended (Doc. 46, pp. 113-115).

Dr. Cruz applied the vacuum to the baby's head and pulled (Doc. 47, p. 129; Ex. 15, p. 5). The vacuum popped off (Doc. 47, pp. 129-30). Dr. Cruz reapplied the vacuum and pulled (Doc. 47, p. 130). Again, the vacuum popped off (*Id.*). Only three pop-offs are allowed during the course of attempted vacuum assisted delivery, but Dr. Cruz was able to deliver the baby's head without the third application of the vacuum (*Id.* at pp. 130-31). The suction, pulling on the baby's vertex, drew the head further and further through the pelvis until crowning; Steven's head then delivered (*Id.* at pp. 130-31; Doc. 51, p. 424). His shoulders remained, impacted, inside (Doc. 47, p. 152).

Shoulder Dystocia

The shoulder dystocia was an immediate medical emergency (Doc. 47, p. 152). Nurse Tellor hit the red emergency button in the delivery room to call for extra help (Doc. 51, p. 425). The iPad, ostensibly translating between Nurse Tellor and Mrs. Zhao, was knocked to the ground (*Id.* at p. 454). Dr. Cruz directed the nurses to put Mrs. Zhao in position for the "McRoberts Maneuver" (*Id.* at p. 426). Nurses flexed both of Mrs. Zhao's legs back toward her abdomen in an effort to re-angle the pelvis (*Id.*; Doc. 47, p. 153). Dr. Cruz had his hands on the baby's head, applying traction—pulling the head (Doc. 47, pp. 154-55). It was imperative that a doctor employ *gentle* traction during the McRoberts maneuver, as any excess traction would damage the baby's brachial plexus

(*Id.* at pp. 155-56). The McRoberts maneuver, including the traction applied to Steven's head by Dr. Cruz, did not relieve the shoulder dystocia (Ex. 21, p. 1).

With the McRoberts maneuver ongoing, Dr. Cruz called for another nurse to apply suprapubic pressure right above Mrs. Zhao's pubic bone in an effort to angle the baby's shoulders toward the largest angle of the pelvis (Doc. 47, p. 154; Doc. 51, p. 427). Adding suprapubic pressure to the McRoberts maneuver, including the continued traction to Steven's head by Dr. Cruz, did not relieve the shoulder dystocia (Doc. 47, p. 154; Ex. 21, p. 1).

Dr. Cruz then attempted another intervention, the "corkscrew" or "Woods Maneuver" (Doc. 47, pp. 156, 164). Dr. Cruz attempted to insert his right hand inside the vagina in an effort to grasp and move the baby's posterior shoulder counterclockwise while guiding the baby's head into the turn with his left hand (*Id.* at pp. 159, 161). The anterior shoulder remained impacted. Dr. Cruz was not able to move the shoulder, in part because he had no space to maneuver his hand (*Id.* at p. 159).

When the size of the baby with respect to the vagina leaves so little space, preventing the doctor from using an inserted hand to sweep around and relieve the shoulder impaction, an episiotomy (cutting the tissue between the vagina and the rectum) or a proctoepisiotomy (cutting the tissue from the vagina fully into the rectum) may give the doctor sufficient room to maneuver the baby and relieve the dystocia (*Id.* at pp. 163, 230; Doc. 51, pp. 473-74). Dr. Cruz did not perform either an episiotomy or a proctoepisiotomy.

Dr. Sherry Jones, an OB/GYN working labor and delivery that day at Carbondale Memorial, responded to the call for help from Mrs. Zhao's room (Doc. 51, p. 467). Dr. Jones testified live at trial on behalf of the United States and explained that, in part by virtue of having smaller hands to navigate the tight space, she was able to put her hand in the vagina and successfully rotate the baby to release the posterior shoulder (*Id.* at pp. 467-68; Doc. 47, p. 162). Dr. Jones agreed that an episiotomy could be helpful in circumstances when the doctor needs more space in order to reach the baby's arm inside the vagina (Doc. 51, pp. 473-74). When Dr. Jones's smaller hands finally relieved the shoulder impaction, Dr. Cruz again pulled on the baby's head to deliver the rest of his body (*Id.* at p. 469; Doc. 47, pp. 164-65).

Steven weighed eleven pounds, six ounces and was 19.5 inches long when he was born (Ex. 18, p. 2).

In Dr. Cruz's previous shoulder dystocia deliveries, he estimated he had been able to relieve the dystocias within three minutes (Doc. 47, p. 152). Dr. Cruz knew that within ten minutes, even within five minutes, of ongoing shoulder dystocia, the baby is prone to brain damage (*Id.* at pp. 165-66). Dr. Jones testified that in her experience, if a shoulder dystocia is not resolved within thirty seconds, she starts to get nervous (Doc. 51, p. 476). And, the longer the dystocia persists, the more nervous one gets (*Id.*). As the seconds and minutes ticked by in Mrs. Zhao's delivery room, Steven's shoulders remained trapped; Mrs. Zhao was crying; the iPad had been knocked over; Ms. Loh was crying, too upset to translate or communicate at all; Steven's face was blue, and he was not breathing. (*Id.* at p. 455; Doc. 47, p. 166).

Steven's shoulder dystocia lasted nine minutes (Ex. 18, p, 2). Dr. Cruz asked the staff in the delivery room *not* to call out the time as the dystocia went on (Doc. 47, p. 167). Dr. Cruz testified that he didn't want to know the amount of time elapsing during the dystocia because after ten minutes he feared he would "do something that I may have to regret" (*Id.*). After ten minutes, he would apply excessive traction to the baby's head (*Id.*). Because he instructed the nurses not to count out the minutes, however, Dr. Cruz did not know if or whether Steven's dystocia had reached the ten-minute mark (*Id.* at pp. 167-68). Dr. Cruz admitted that given the time pressure and increasing nervousness as Steven's shoulder dystocia wore on, it was possible he inadvertently exerted excessive traction on Steven's head (*Id.* at pp. 168-71). Doing so, he admitted, would result in the brachial plexus injury (*Id.*).

Brachial Plexus Injury and Surgery

When he was fully delivered, Steven's heart was not beating, and he was not breathing (Ex. 18, p. 3). At ten minutes, he was resuscitated with oxygen, endotracheal intubation, and chest compressions (*Id.*). He was transferred to Cardinal Glennon Children's Hospital Neonatal Intensive Care Unit in St. Louis, Missouri, where he remained until July 6, 2014.[7] (Ex. 40, p. 222; Ex. 5, p. 9).

When he was one month old, Steven began treating at the Washington University in St. Louis Brachial Plexus Palsy Center with Dr. Michael J. Noetzel (Ex. 24; Ex. 35, pp. 1-2). Steven also began occupational and physical therapy at Children's Hospital in St.

[7] Not surprisingly, Steven's delivery left Mrs. Zhao with a second-degree perineal tear, a "very large" vulvar edema, right hip pain, and the inability to walk unassisted in the following days (Ex.18, p. 465; Ex. 21, p. 1).

Louis (*see* Ex. 6, p. 121). Dr. Noetzel confirmed the diagnosis of brachial plexus injury, noting the flaccid paralysis, weakness, and lack of normal movement of the right arm—which had shown minimal improvement since birth (Ex. 35, pp. 1-2).

The brachial plexus is a collection of nerves flowing out from the mid neck area of the spinal cord (Noetzel Depo, p. 10). Those nerves produce all the movement in the shoulder, arm, and hand (*Id.*). A brachial plexus injury of the type incurred by Steven is a mechanical, stretch injury (*Id.* at p. 11). During the injurious event, the nerves might be stretched and thinned out; ruptured—stretched and broken; or avulsed—tantamount to ripping an electric cord out from a wall socket (*Id.*).

Given Steven's lack of improvement, good recovery of movement and strength in his right arm seemed less certain than might otherwise be expected in a baby with brachial plexus injury (Ex. 35, p. 2). After multiple follow-up visits and physical therapy with little improvement, Steven underwent an MRI of his cervical spine (*Id.* at p. 11). The MRI revealed that Steven's brachial plexus injury involved the avulsion of Steven's right C7 nerve root (*Id.*). In other words, his nerves had been torn away from his spinal cord (Noetzel Depo, pp. 13-14).

Following the MRI, in March 2015, Steven underwent surgical exploration, repair, and grafting of his right-side brachial plexus nerves at St. Louis Children's Hospital (Ex. 26; Ex. 6). Without that surgical intervention, the persistent weakness in the deltoid, bicep, and tricep was not expected to improve (Ex. 26). In addition to the avulsion injury at C7, Steven was observed to have scar tissue involving nerve roots C5 – C7 resulting from the original stretching injury (Noetzel Depo, p. 29). The March 2015 surgery

attempted to graft or bypass injured nerves in order to create a pathway for nerve regrowth (*Id.* at p. 30).

At the time of trial, Steven was receiving occupational therapy approximately twenty-five minutes per week from OT assistants as part of special education intervention services at his pre-school (Doc. 51, p. 499). Clara Ellis, an occupational therapist for Williamson County Education Services (WCES),[8] testified live at trial on behalf of the United States. She evaluates Steven annually and sees him a few times per year (*Id.* at p. 497). [9] Her reports, made in conjunction with Steven's annual Individualized Education Program ("IEP"), focus on Steven's abilities in school (Doc. 51, pp. 482, 510). Steven is eligible for special education services because his injury limits his ability to otherwise benefit from or participate in the classroom (*Id.* at p. 482). Those services are only available until the time Steven turns twenty-two (*Id.* at p. 500).

After the surgery, Steven continued follow-up examinations with his surgeon, Dr. Tae Park. At a visit on June 21, 2017, Dr. Park noted that Steven might continue to make musculoskeletal gains for the next two to three years (Ex. 25). The nerve re-growth only lasts for two to three years following surgery, then improvement plateaus (Noetzel Depo,

[8] WCES is a special education co-op that provides services to five different school units in Williamson County, Illinois.

[9] Ms. Ellis completed Steven's assessment for his 2019 IEP a short time before the trial (Doc. 51, p. 482). She testified that when Steven first came to WCES, he initially was very weak and was unable to lift his right arm even against gravity to his shoulder to touch his nose (*Id.* at p. 485) He was able to lift his arm only to about ninety degrees (*Id.*). He had a lot of difficulty with bilateral coordination, being able to utilize that arm to come in and do fine motor tasks that require two hands (*Id.*). Fortunately, Steven has shown improvement. On the playground, he is able to hold onto the swing and swing with two hands, and he is "able to climb the slide, although when he gets near the top he tends to let go with this arm." (*Id.* at p. 486). She was unsure if that was due to fatigue or because he no longer needed the handholds (*Id.*). She noted that Steven is able to do some gross motor activities during gym time (*Id.* at pp. 486-487), but there are some differences in the fluidity of movement between his two arms (*Id.* at p. 487).

pp. 34-35). As Dr. Noetzel testified in March 2019, Steven might get better; he won't be normal (*Id.* at p. 32).

Expert Testimony

Michael J. Noetzel, M.D.—Treating Physician (Plaintiff)

Dr. Noetzel, one of Steven's treating physicians, testified by deposition. The Court reviewed Dr. Noetzel's video-taped deposition, as well as the written transcript.[10] Dr. Noetzel last examined Steven in June 2017 (Ex. 35, p. 18).

Dr. Noetzel is the Medical Director of Clinical and Diagnostic Neuroscience Services at St. Louis Children's Hospital; Vice Chair of the Division of Pediatric and Developmental Neurology at Washington University School of Medicine; and Professor in the Department of Neurology and Pediatrics (Ex. 33, p. 1). He is board certified in Pediatrics, Neurology with special qualifications in Child Neurology and Neurorehabilitation (*Id.* at p. 6). He has published numerous peer-reviewed articles and textbook chapters, been on the editorial boards for the journals *Neurology* and *Pediatric Neurology*, been invited to give numerous professional lectures and presentations, and continues to provide direct clinical patient care (*Id.* at pp. 7-28). Dr. Noetzel has been practicing pediatric neurology for thirty-eight years (Noetzel Depo, p. 5).

In addition to explaining his treatment and surgical follow-up of Steven, Dr. Noetzel gave his opinion on Steven's probable future limitations given his brachial plexus injury. Dr. Noetzel testified that Steven's injuries are permanent and explained that the neurological surgical intervention he underwent was designed to make him stronger, not

[10] In the video, Dr. Noetzel demonstrated Steven's physical limitations described in his medical records. This was beneficial to help the Court understand Steven's range of movement deficits discussed below.

normal. Once Steven's post-surgical improvement plateaus, he should at least be able to maintain the gains he has made thus far (*Id.* at p. 35). Because Steven will never have normal strength in his right arm, however, he is susceptible to tightness necessitating orthopedic follow-up care (*Id.*). The discrepancy between strength and function in the different muscles of his shoulder, arm, and hand will cause Steven problems for the foreseeable future. For example, while Steven has gained movement in internal shoulder rotation (marked four out of five), his external rotation remains weak (two out of five) (*Id.* at pp. 35-36). Dr. Noetzel testified that Steven will, to a reasonable degree of medical certainty, require further surgery from an orthopedist to address issues of tightening (*Id.* at p. 36). And Steven will require continued follow-up with physiatrists and therapists to address the ongoing challenges caused by his inability to use his right arm in a normal fashion (*Id.* at p. 38). In Dr. Noetzel's professional opinion, Steven will require those services for the rest of his life (*Id.*).

According to Dr. Noetzel, Steven's brachial plexus injury will impede most physical activities and activities of daily living. For example, if Steven wants to scratch his head with his right hand, he will need to contort in an awkward way to do so, because he cannot bend his bicep up against gravity (*Id.* at p. 41). Feeding himself will be a two arm operation (*Id.* at pp. 41-42). Twisting door knobs will be problematic (*Id.* at p. 42). He might be able to type with "hunt and peck" proficiency, but will likely require a voice-activated keyboard system (*Id.* at p. 43).

According to Dr. Noetzel, any task requiring two hands or requiring independent, normal function of the right arm will always be a challenge for Steven (*Id.* at p. 47). He

will have to pick and choose which activities he can do, with adaptive "tricks" to compensate for the right arm (*Id.* at p. 48).

Not only will Steven need to improvise with respect to how he uses his arms in order to perform certain tasks, his right arm will always be noticeably smaller and shorter than his left arm—particularly after he goes through puberty (*Id.* at p. 45). His injury permanently limits his ability to lift, hold, and carry objects with his right hand and arm (*Id.* at pp. 61-62). Steven's injury permanently limits the grip strength, range of motion, and general use of his right hand and arm (*Id.*). Finally, Dr. Noetzel testified:

> Q. In your opinion to a reasonable degree of medical certainty, is the injury [Steven] suffered permanent?
>
> A. Yes, it is.
>
> Q. Is it permanently disabling?
>
> A. Yes.
>
> Q. Will it interfere with his ability to enjoy a normal life?
>
> A. Yes.

(*Id.* at p. 44).

Michael S. Cardwell, M.D.—Standard of Care and Causation (Plaintiff)

Dr. Cardwell also testified by deposition on behalf of Mrs. Zhao. Dr. Cardwell is a Maternal Fetal Medicine Specialist practicing in Akron, Ohio (Cardwell Depo, pp. 6, 8). Previously, Dr. Cardwell served as the Director of the Maternal Fetal Medicine Departments at: St. Vincent Mercy Medical Center in Toledo, Ohio; St. Charles Mercy Hospital in Oregon, Ohio; Riverside Mercy Hospital in Toledo, Ohio; The Toledo Hospital in Toledo, Ohio; the University of Missouri-Columbia in Missouri; and the

Rockford Regional Perinatal Center in Rockford, Illinois (Ex. 31, p. 2). Dr. Cardwell is board certified in Obstetrics and Gynecology and Maternal Fetal Medicine (*Id.* at pp. 7-8). He is the author or co-author of over ninety articles for peer-reviewed publications (*Id.* at pp. 11-15). Dr. Cardwell has been practicing obstetrics and maternal fetal medicine for thirty-five years and estimates he has delivered over 10,000 babies (Cardwell Depo, p. 12).

Dr. Cardwell identified the multiple risk factors that should have alerted Dr. Cruz to macrosomia and shoulder dystocia (*Id.* at pp. 16-17, 42; Ex. 30, p. 2). First, the fundal height at term for an average size baby should not exceed thirty-six centimeters, yet Mrs. Zhao's fundal height at term was at least forty-one centimeters (Cardwell Depo, p. 17). And Mrs. Zhao's previous macrosomic baby put her at significantly greater risk for another macrosomic birth and, thereby, shoulder dystocia (*Id.* at p. 42). Mrs. Zhao's age at delivery, thirty-five, also was an additional risk factor for shoulder dystocia (*Id.*).

Dr. Cardwell opined that the standard of care required Dr. Cruz to obtain an ultrasound examination for estimated fetal weight, and Dr. Cruz violated the standard of care by failing to do so (*Id*. at pp. 43-44; Ex. 30, p. 2).

Dr. Cardwell had never heard of, nor could he find any reference to, the "Sicurenza method" of estimating fetal weight (Cardwell Depo, pp. 18-19; Ex. 30, p. 2). Dr. Cruz's "Sicurenza" estimation of the baby's weight differed from Steven's actual birthweight by as much as fifty percent (Cardwell Depo, p. 21). Dr. Cardwell had never seen a clinician's fetal weight estimation so far off the actual birthweight (*Id.*). In Dr. Cardwell's experience and opinion, the most accurate, objective method of estimating fetal weight is ultrasound (*Id*. at p. 26). An ultrasound examination is required if the fundal height measurement

differs from what is expected given the gestational age, as Mrs. Zhao's did (*Id.*). In Dr. Cardwell's opinion, in light of Steven's actual birthweight, had an ultrasound been performed, it would have found fetal macrosomia (*Id.* at p. 31).

Dr. Cardwell further opined that Dr. Cruz's failure to recommend a primary Cesarean section for fetal macrosomia was another violation of the standard of care (*Id.* at p. 44; Ex. 30, p. 2). For a woman with previous deliveries, the second stage of labor should have lasted no longer than an hour (Cardwell Depo, p. 27). Mrs. Zhao's prolonged second stage of labor indicated cephalopelvic disproportion (*Id.*). At this point, the standard of care required delivery by Cesarean section (*Id.*; Ex. 30, p. 2). Dr. Cruz's management of Mrs. Zhao's labor and delivery obviously fell below that standard (*Id.*).

Dr. Cruz introduced an additional risk factor for shoulder dystocia into the delivery when he attempted to complete the vaginal delivery with a vacuum extractor (Cardwell Depo, p. 27; Ex. 30, p. 2). Vacuum extraction was contraindicated given the increased risk of shoulder dystocia (Cardwell Depo, p. 32; Ex. 30, p. 2). The vacuum extraction directly led to the shoulder dystocia (Ex. 30, p. 2). Dr. Cruz violated the standard of care by attempting to vacuum the baby's head out (*Id.*; Cardwell Depo, pp. 31-32).

According to Dr. Caldwell, shoulder dystocia was entirely foreseeable given Dr. Cruz's course of action (Ex. 30, p. 2). Additionally, once the McRoberts, suprapubic pressure, and Woods maneuvers failed to relieve the shoulder dystocia, an episiotomy or proctoepisiotomy would make successful delivery of the baby's posterior arm more likely (*Id.* at p. 3). Dr. Cruz's failure to perform an episiotomy or proctoepisiotomy, in order to

give himself more room to effectuate delivery and relieve the shoulder dystocia, violated the standard of care (*Id.*; Cardwell Depo, pp. 48-49, 53-54). And Dr. Cardwell was reasonably certain Dr. Cruz's use of traction resulted in the brachial plexus injury (Ex. 30, p. 2).

Dr. Cardwell opined that if Dr. Cruz adhered to the standards of care identified in his expert report, the delivery would not have been complicated by shoulder dystocia, and Steven would not have sustained brachial plexus damage (*Id.* at p. 3).

Robert Gherman, M.D.—Standard of Care and Causation (Defendant)

Dr. Robert Gherman testified live at trial on behalf of Dr. Cruz. (Doc. 47, p. 189). Dr. Gherman is a board-certified OB/GYN and maternal-fetal medicine specialist (Ex. 201, p. 1).[11] He has participated in approximately 7,500 deliveries during his career and is still actively delivering babies (Doc. 47, p. 192). He has published numerous articles and served as the chairman of ACOG's task force on neonatal brachial plexus palsy from September 2011 through April 2014 (Ex. 202, p. 4). He is a co-author of ACOG's 2014 Neonatal Brachial Plexus Palsy report, which addressed the potential causes of neonatal brachial plexus injury and stressed that newborn brachial plexus injury does not necessarily imply negligence on the part of the delivering doctor (Doc. 47, pp. 343-45). Dr. Gherman also authored a recent ACOG Practice Bulletin regarding shoulder dystocia, as well as book chapters on this topic (*Id.* at p. 195; Ex. 201, p. 1).

At the request of the United States, Dr. Gherman reviewed the medical records and depositions in this case and produced an expert report, which was admitted into

[11] Dr. Gherman's curriculum vitae was admitted as Exhibit 202.

evidence as Exhibit 201. The expert report examines the prenatal care Dr. Cruz provided to Mrs. Zhao, the management of her labor, and the delivery of Steven on June 15, 2014, and states Dr. Gherman's opinions to a reasonable degree of medical certainty (Ex. 201).

On the question of whether Dr. Cruz should have ordered an ultrasound during the June 12, 2014 appointment with Mrs. Zhao, Dr. Gherman found that no breach of the standard of care occurred, for the following reasons:

- Mrs. Zhao's fundal height at that appointment was "concordant," meaning that at forty-one centimeters, it was less than two centimeters ahead of her weeks' gestational age of thirty-nine weeks and six days (*Id.* at p. 3; Doc. 47, p. 215).

- A fundal height measurement of forty-one centimeters does not signify a large fetus (*Id.*).

- Even if an ultrasound had been conducted and the study identified fetal macrosomia, this would not have been an indication for a Cesarean section (Ex. 201, pp. 3-4; Doc. 47, p. 215)

- There is no evidence available to determine what an ultrasound examination would have shown, even if one had been ordered (Ex. 201, pp. 3-4; Doc. 47, p. 216).

- The standard of care does not require a physician to order a third trimester ultrasound because of a mother's prior delivery of a macrosomic infant (Doc. 47, p. 217).

Dr. Gherman opined that while a mother who has previously delivered a macrosomic baby is at risk for having another, this alone does not require a change in management of the pregnancy (*Id.*). And, even if a physician suspects fetal macrosomia, an elective Cesarean section is not indicated, as there is no defined weight threshold at which a Cesarean section is required (*Id.* at pp. 219-22). At an estimated fetal weight of

5,000 grams or above, an elective Cesarean section may be considered under the guidelines from the practice bulletin on fetal macrosomia (*Id.*)

Dr. Gherman opined that, in Mrs. Zhao's case, her previous delivery of an eleven-pound, twelve-ounce infant with no problems indicated that her pelvis was proven for delivery of another infant up to that weight (*Id.* at p. 223). Concerning the length of Mrs. Zhao's labor, Dr. Gherman found that the seventy-four-minute second stage of labor would not be considered prolonged, and that there was no arrest of descent that would have warranted a Cesarean delivery (*Id.* at p. 229).

Dr. Gherman testified that labor and delivery was not contraindicated for Mrs. Zhao given her previous uncomplicated delivery of a large baby, and Dr. Cruz did not violate the standard of care by allowing her to labor (*Id.* at pp. 223-24). Dr. Gherman also testified that Dr. Cruz's use of the vacuum extractor was within the standard of care, because maternal exhaustion is an accepted indication for use of the device (*Id.* at pp. 224, 228-29). And, in Dr. Gherman's opinion, the shoulder dystocia itself could not have been created by the vacuum extractor, because it was not applied until Steven's head was crowning or showing (*Id.* at pp. 225, 229). At that point, Steven's shoulder was already obstructed, and therefore the dystocia had already occurred (*Id.*).

According to Dr. Gherman, performing an episiotomy or proctoepisiotomy would not have made it any easier to perform the maneuvers, because Dr. Cruz was able to insert his hand into the vagina sufficiently to push the posterior arm upwards (*Id.* at pp. 230-31). In Dr. Gherman's opinion, the outcome for Steven would be no different had an episiotomy or proctoepisiotomy been performed (*Id.* at p. 231).

The final point of Dr. Gherman's report refutes the argument that Steven's brachial plexus injury was caused by "excessive traction" applied by Dr. Cruz (*Id.* at 232). Dr. Gherman explained that in a case of posterior shoulder dystocia, the medical literature finds that forces exerted by the medical provider cannot be the cause of an injury to the brachial plexus on that side, as the shoulder is impacted on the sacral promontory before the head delivers (*Id.* at pp. 232-33, 236). Instead, the source of traction that can create a brachial plexus injury with posterior shoulder impingement is the dystocia itself, that is, the differential angle of the head and neck (*Id.* at p. 233, 236). The differential traction applied to the brachial plexus in the case of a posterior shoulder dystocia can be sufficient to cause a nerve root avulsion injury, and that was the cause of Steven's injury (*Id.* at pp. 233-34). Dr. Gherman opined that Dr. Cruz met the standard of care with regard to his care of Mrs. Zhao, and Steven's injury did not occur as the direct result of any action or inaction by Dr. Cruz (*Id.* at pp. 240-41).

<u>David Gibson—Pecuniary Damages (Plaintiff)</u>

David Gibson, M.B.A., M.R.C., testified by deposition. Mr. Gibson produced a Vocational Economic Assessment for Steven Zhao, projecting the impact of Steven's disability on employment and earnings over his lifetime (Gibson Depo, p. 6). Mr. Gibson interviewed Mrs. Zhao in addition to reviewing depositions, medical records, and educational records (Ex. 28, pp. 2-3). Mr. Gibson references an extensive bibliography and multiple sources of statistics in the 49-page Vocational Economic Assessment (*Id.* at pp. 33-49). Mr. Gibson typically performs economic assessments for five to ten brachial plexus injury cases per year (Gibson Depo, p. 12).

Mr. Gibson calculated Steven's future Annual Earning Capacity both with and without the limitations of his brachial plexus injury (*Id.* at p. 13). Mr. Gibson estimated multiple possible earning capacities for Steven based on varying levels of education he might obtain (*Id*. at pp. 13-14). For example, were Steven able to obtain a high school diploma, his average annual earning capacity if he had not been injured would be $40,761; it is $35,839 with his injury (Ex. 28, p. 4). Mr. Gibson then identified a range of worklife expectancies for Steven, both with his injury and as though Steven had no disability (*Id.* at p. 5). Mr. Gibson performed a present value calculation for every potential future lost earnings sum (*Id.* at pp. 26-32).

Per Mr. Gibson's Assessment, over the course of his expected worklife, Steven will lose earning capacity due to his brachial plexus injury in the amount of: $916,793 if he earns a high school diploma; $1,043,076 with an associate's degree; and $1,581,779 with a bachelor of arts or bachelor of science degree. (*Id.* at p.5).

Susan A. Entenberg, M.A., L.C.P.C.—Pecuniary Damages (Defendant)

The United States presented the deposition testimony of Ms. Susan Entenberg, a vocational rehabilitation counselor at Rehabilitation Services Associates who was retained by the United States to offer expert opinion on Steven's future ability to obtain an education and employment.[12]

Ms. Entenberg has worked as a vocational rehabilitation counselor since 1975 (Entenberg Depo, p. 9). She provides services in three main areas: (1) as an independent vocational expert retained by the Social Security Administration to provide opinions to

[12] Ms. Entenberg's report was admitted as Exhibit 203, and her curriculum vitae was admitted as Exhibit 204.

the administrative law judge during disability hearings; (2) as a vocational expert retained to provide opinions in workers' compensation commission proceedings; and (3) as a retained expert in civil litigation. (*Id.* at pp. 11-12).

To prepare her opinions in this case, Ms. Entenberg reviewed all available records from Steven's birth and subsequent treatment; the reports issued by Dr. Michael Cardwell, Shoshana Church, and David Gibson; and the deposition transcripts of Dr. Sherry Jones, Crystal Tellor, Dr. Paul Cruz, and Mrs. Zhao (*Id.* at pp. 17-19; Ex. 203, p. 1). Although Ms. Entenberg reviewed and considered all of the available medical records when preparing her report, she found the records from Williamson County Educational Services ("WCES") to be the most relevant to her analysis as a vocational rehabilitation counselor (*Id.* at pp. 21-22).

The WCES records primarily relied upon by Ms. Entenberg assess "Present Levels of Academic Achievement and Functional Performances" and are dated April 6, 2018 (Ex. 219, p. 1). The 2018 WCES records include a description of Steven's strengths, parental education concerns/input, health information/concerns, Steven's present level of academic achievement, and his present levels of functional performance (*Id.*). Within the functional performance assessment, the WCES records address range of motion, strength, fine motor, sensory, and daily living (*Id.* at p. 5). Ms. Entenberg found the 2018 WCES records to be significant to her analysis because they were the most recent records available to her that assessed functioning and levels of performance (Entenberg Depo, pp. 21-22). Furthermore, the records specifically evaluated Steven's functioning and levels of performance in terms of activities of daily living and other activities, which are

important from a vocational rehabilitation point of view (*Id.*). Ms. Entenberg considers functional capability to include sitting, standing, walking, lifting, ability to reach, and use of the hands (*Id.* at p. 199).

As a vocational rehabilitation counselor, Ms. Entenberg often relies upon specialists in their respective fields when forming her opinions (*Id.* at p. 201). She does not consider the cause of the injury, but relies upon the information that provides functional limitations and actual restrictions (*Id.* at pp. 198-199).

In addition to analyzing Steven's functional abilities, Ms. Entenberg reviewed Steven's learning abilities and cognitive development (*Id.* at pp. 21-22). Based on the records available to her, Ms. Entenberg noted that there was no indication that Steven has any type of learning or cognitive problems and that Steven was assessed as having skills near his age expectation (*Id.* at p. 22; Ex. 203, p. 1).

Ms. Entenberg's report states that Steven is progressing well in his English communication skills (Ex. 203, p. 2). She further notes that Steven is bilingual, speaking both Mandarin Chinese and English, and that this skill will be an asset in the labor market (*Id.*). Ms. Entenberg believes that Steven will be able to become proficient in computer use because he is able to use his fingers and perform bilateral tasks (*Id.*; Entenberg Depo, p. 25). If needed, technology is available to assist Steven when he uses a computer, such as voice actuated software and adaptive keyboards (Ex. 203, p. 2; Entenberg Depo, pp. 25-26).

In light of Steven's cognitive, social and physical abilities, Ms. Entenberg opined that Steven will have no barriers to succeeding in educational endeavors (Ex. 203, p. 3).

Ms. Entenberg did not assume, however, that Steven would obtain a college degree for purposes of her conclusions in this case (Entenberg Depo, p. 207). After Ms. Entenberg had an understanding of Steven's functional abilities, physical limitations, and cognitive capabilities, she considered different types of employment that Steven could obtain (*Id.* at p. 26). It is Ms. Entenberg's opinion that Steven will experience an erosion of the overall labor market that would otherwise be available to him, meaning that he will not be capable of performing occupations that require full strength and movement in both arms (*Id.* at pp. 26-27; Ex. 203, p. 2). These occupations, such as construction and machine operation, fall into the medium to heavy categories of exertion, which are defined by the United States Department of Labor (Entenberg Depo, p. 27).

Although Steven will likely be unable to perform manual labor occupations requiring a medium to heavy level of exertion, Ms. Entenberg determined that Steven will be able to perform sedentary to light types of occupations, including teacher, accountant, computer information system analyst, and engineer (*Id.*at pp. 27-28; Ex. 203, p. 2). These occupations are developing and growing in the economy (Entenberg Depo, p. 28). The median hourly wages for these positions, based on the Department of Labor, Bureau of Labor Statistics, Occupational Employment Statistics, May 2017 (released March 30, 2018), are respectively, $23.43, $33.34, $40.67, and $44.34 (Ex. 203, p. 2).

Even if Steven does not obtain an associate's degree or a bachelor's degree, there will still be jobs available to him according to Ms. Entenberg (Entenberg Depo, pp. 29-31). Examples of such jobs include those in the administrative or clerical support field, including accounting clerk or payroll clerk (*Id.* at, p. 30). He also would be capable of

working as a sales representative or in purchasing, particularly given his ability to speak both Chinese and English, or as a real estate agent (*Id.* at p. 30).

Of the occupations that Steven could obtain without a college degree, it is possible that Steven could obtain employment that pays as much as engineering or other manual labor positions (*Id.* at pp. 207-209).

Given the opportunities available to Steven, Ms. Entenberg believes he will be able to adapt his education and career path to pursue some of the careers that he is able to perform (*Id.* at p. 32). There are also vocational rehabilitation services that will be available to help Steven as he continues his education and career path (*Id.* at p. 33).

In sum, Ms. Entenberg concluded that Steven will be capable of attaining employment and sustaining employment on an ongoing basis (*Id.* at p. 34). Ms. Entenberg further found that there was no indication that Steven would not be capable of obtaining full-time employment (*Id.* at p. 29). Thus, in Ms. Entenberg's opinion, Steven's injury to his right arm ultimately will not cause him to lose any wages or income (*Id.* at pp. 210-211).

DISCUSSION

Applicable Legal Standards

The FTCA provides a remedy for personal injury caused by the negligent or wrongful act of any government employee acting within the scope of his employment "under circumstances where the United States, if a private person, would be liable to the claimant in accordance with the law of the place" where the act occurred. 28 U.S.C. § 1346(b)(1); *See United States v. Muniz*, 374 U.S. 150, 153 (1963). The FTCA further

provides that before a plaintiff may file suit against the United States for personal injury or death, the plaintiff must first present the claim to the appropriate federal agency and be denied compensation. *Zurba v. United States*, 318 F.3d 736, 738 (7th Cir. 2003) (citing 28 U.S.C. § 2675(b)).

In suits properly brought under the FTCA, the Court applies the law of the state in which the acts or omissions occurred. 28 U.S.C. § 1346(b)(1). Accordingly, Illinois law regarding medical professional negligence governs this case. *See* IL-IPICIV 1.05.01.

Under Illinois law, in a medical malpractice action, a plaintiff bears the burden of showing: "(1) the proper standard of care by which a physician's conduct may be measured, (2) a negligent failure to comply with the applicable standard, and (3) a resulting injury proximately caused by the physician's lack of skill or care." *Massey v. United States*, 312 F.3d 272, 280 (7th Cir. 2002); *Donais v. United States*, 232 F.3d 595, 598 (7th Cir. 2000); *Sullivan v. Edward Hosp.,* 209 Ill.2d 100, 112 (2004); *Neade v. Portes,* 193 Ill.2d 433, 443–44 (2000); *Purtill v. Hess,* 111 Ill.2d 229, 241–42 (1986). Medical expert testimony is required to establish the applicable standard of care and the medical professional's deviation from it. *Sullivan*, 209 Ill.2d at 112.

"Proximate cause in a medical malpractice case must be established by expert testimony to a reasonable degree of medical certainty, and the causal connection must not be contingent, speculative, or merely possible." *Morisch v. United States*, 653 F.3d 522, 531 (7th Cir. 2011) (quote omitted). To establish proximate cause, a plaintiff must show cause-in-fact and legal cause. *Id*. Cause-in-fact exists under Illinois law when the defendant's conduct is a material element and a substantial factor in bringing about the

injury. *Palay v. United States*, 349 F.3d 418, 432 (7th Cir. 2003) (quotation omitted). To prove legal cause, a plaintiff must also show that an injury was foreseeable or the type of harm that a reasonable person would expect to see as a likely result of his or her conduct. *Id*.; *see Simmons v. Garces,* 198 Ill.2d 541, 556 (2002); *Buck v. Charletta,* 2013 IL App (1st) 122144, ¶ 59 (2013); *Kedzie v. DeKalb Clinic Chartered*, 2016 IL App (2d) 150671-U, ¶ 42 (2016). Proximate causation exists where the defendant's negligence was "a material and substantial element in bringing about the injury." *Wille v. Freeland*, 2015 IL App (2d) 140964-U, at ¶ 21 (July 1, 2015) (quoting *First Springfield Bank & Trust v. Galman,* 188 Ill.2d 252, 258 (1999)).

With respect to medical expert testimony in particular, there are two foundational requirements: "the health-care expert witness must be a licensed member of the school of medicine about which the expert proposes to testify" and "the expert must be familiar with the methods, procedures and treatments ordinarily observed by other health-care providers in either the defendant's community or a similar community." *Sullivan*, 209 Ill.2d at 114–15 (citing *Jones v. O'Young*, 154 Ill.2d 39, 44 (1992), and quoting *Purtill*, 111 Ill.2d at 242–43)).

Standard of Care

In light of all the evidence, the Court finds that the applicable standard of care during Mrs. Zhao's prenatal care, labor, and delivery required Dr. Cruz to:

- Order an ultrasound for estimation of fetal weight after either Mrs. Zhao's May 29, 2014 or her June 12, 2014 prenatal appointment;

- Recommend a primary Cesarean section before the onset of Mrs. Zhao's labor, including informing Mrs. Zhao of the probability of a

macrosomic baby and the risks of shoulder dystocia and brachial plexus injury in vaginal birth of a macrosomic baby;

- Recommend delivery by Cesarean section during Mrs. Zhao's second stage of labor, including an explanation of the risks and benefits of Cesarean versus vaginal versus operative vaginal delivery to Mrs. Zhao, informing her of the probability of a macrosomic baby, the risks of shoulder dystocia and brachial plexus injury in vaginal birth of a macrosomic baby, and the additional risk of shoulder dystocia with operative vaginal delivery by vacuum extraction;

- Refrain from operative vaginal delivery utilizing vacuum extraction;

- Perform an episiotomy or proctoepisiotomy in order to successfully perform the Woods maneuver to relieve shoulder dystocia; and

- Exert only gentle traction on Steven's head during attempts to relieve shoulder dystocia.

Deviations from the Standard of Care

In light of the evidence introduced at trial and discussed above, the Court concludes that Dr. Cruz deviated from the standards of care in the following respects.

1. Failure to Order an Ultrasound.

Ultrasound is the most objective form of estimating fetal weight (Cardwell Depo, p. 26). Dr. Cruz himself testified that when the fundal height varies from the gestational age by two centimeters, an ultrasound is required (Doc. 46, pp. 91-92). At two of Mrs. Zhao's late term prenatal visits, there was such a two-centimeter discrepancy. For instance, as mentioned above, on June 12, 2014, at 39.6 weeks gestational age, the recorded fundal height was written over but is either "41" or "42." Dr. Cruz admitted it could have been forty-two. And, at the visit before that, on May 29, 2014, Mrs. Zhao's

recorded fundal height was forty—more than a two-centimeter variance from her gestational age of 37.6 weeks (Ex. 41, p. 56).

The United States argues that there is no way to tell what an ultrasound would have shown, had it been ordered on June 12 (or presumably on May 29). According to Dr. Gherman, the standard of care did not require a third trimester ultrasound just because Mrs. Zhao had previously delivered a macrosomic infant. Dr. Gherman also opined that there is no way to know what an ultrasound would have shown, and, even if it identified fetal macrosomia, that finding would not have been an indication for a Cesarean section.[13]

It is true that an ultrasound may have predicted a smaller baby or overestimated the baby's weight. But at a minimum, an ultrasound would have provided Dr. Cruz *additional information* to confirm or debunk his "Sicurenza" estimations (Doc. 46, p. 94). And, if an ultrasound had been ordered at one of the final prenatal visits—or even when Mrs. Zhao presented in labor—everything that happened to Steven (and Mrs. Zhao, for that matter) could have been avoided. It simply may have never happened.

Dr. Cruz admitted that the fetal ultrasound is accurate plus or minus one pound (Doc. 46, p. 94). With that admittedly reliable range, and given Steven's birthweight of eleven pounds, six ounces, it is more likely than not the ultrasound would have shown

[13] Dr. Gherman has been an active expert in shoulder dystocia cases since 1997 (Doc. 47, p. 253). Almost all (90-95%) of his expert work has been on behalf of defendants (*Id.* at p. 244). His consulting fees are sometimes in excess of $30,000 per case (*Id.* at p. 245-251). It troubles the Court that—in reaching his opinions in Steven's case—Dr. Gherman relied on an ACOG report he co-authored, entitled "Neonatal Brachial Plexus Palsy" (*Id.* at p. 248; Ex. 221). The report was published in 2014—years after Dr. Gherman had established a career as a defense expert (Ex. 221). Dr. Gherman's financial interest in the ACOG report cannot be ignored when weighing the competing opinions in this case.

Dr. Cruz a birthweight range from ten pounds, six ounces to twelve pounds, six ounces (*Id.* at pp. 95-96, 102). The "low" end of that weight range, ten pounds, six ounces, is over 4,700 grams, macrosomic, and the mid-to-high-end range of the ultrasound's weight estimate astronomically increased the likelihood of shoulder dystocia (*Id.* at pp. 104-05).

Dr. Cruz himself testified that any indication of fetal macrosomia, whether by fundal height measurement variance or by any other clinical observation, necessitates a late-term ultrasound (*Id.* at p .99). By his own "Sicurenza" calculation, Dr. Cruz estimated the baby's weight would be anywhere from seven pounds, one ounce to nine pounds, one ounce (*Id.* at p. 89). Nine pounds, one ounce is approximately 4,110 grams—more than the 4,000-gram macrosomia threshold (*Id.* at p .99).

Dr. Cruz's own fetal weight estimate should have, in and of itself, prompted Dr. Cruz to order a late term ultrasound (*Id.* at p. 100). He did not. And, in addition to the large fundal measurements, Dr. Cruz knew Mrs. Zhao had previously delivered a very large, macrosomic baby. This knowledge was significant—even without any additional details of Alex's birth. This additional risk factor for macrosomia, and thereby, shoulder dystocia and brachial plexus injury, further necessitated an ultrasound in order to accurately estimate fetal weight. Contrary to the Government's argument, the standard of care did not allow Dr. Cruz to simply *assume* that because Mrs. Zhao previously delivered a macrosomic baby that she could do so again this time without complications.

Simply put, Dr. Cruz's reliance on his "Sicurenza" method—given the fundal measurements, Mrs. Zhao's history of macrosomic infant, and the total dearth of recognition given the "Sicurenza" method in the medical community (even the

Government's expert, Dr. Gherman, had never heard of it)—fell far below the standard of care under these circumstances.

2. Failure to Recommend a Primary Cesarean Section and to Inform Mrs. Zhao of the Probability of a Macrosomic Baby and the Risks Associated with a Vaginal Birth.

It is undisputed that delivery by scheduled Cesarean section would have prevented Steven's brachial plexus injury. Again the standard of care required Dr. Cruz to appreciate the significant risk that Mrs. Zhao's baby would be macrosomic and likely incur shoulder dystocia and brachial plexus injury during a vaginal delivery.

Mrs. Zhao testified that at different times throughout her pregnancy, she wanted a Cesarean section and expressed as much to Dr. Cruz. The Court found Mrs. Zhao highly credible on this point and rejects the Government's assertions that she refused a Cesarean section on June 12, during labor, or anytime in between.[14] *Even if* Mrs. Zhao did in fact express any aversion to surgery whatsoever, if Dr. Cruz had simply explained to Mrs. Zhao the risks inherent in the vaginal delivery of a suspected macrosomic baby, including the significant risk of shoulder dystocia and brachial plexus injury, then Mrs. Zhao could have made an *informed* decision regarding Cesarean section delivery.

[14] As noted above, there is no notation in the medical record that Mrs. Zhao wanted to avoid a Cesarean section. Dr. Cruz did not testify during his deposition that Mrs. Zhao had stated a desire to avoid an incision (Doc. 51, pp. 567, 569). In fact, the first time Dr. Cruz mentioned Mrs. Zhao's aversion to a Cesarean section incision was on direct during the final day of trial, after he had testified as an adverse witness in her case in chief. And, although the United States argues that it makes sense that she wanted to avoid a Cesarean section because it was important that she get back to work quickly, during trial Mrs. Zhao testified that at the time she delivered Steven, the restaurant was doing well, and she had hired an employee to help run the buffet (Doc. 48, p. 389). Additionally, her childcare load at the time was slightly less demanding, as one of her sons, Benjamin, was visiting China (*Id.* at pp. 388-89).

3. Failure to Recommend Cesarean section During Mrs. Zhao's Second State of Labor and to Explain the Risks and Benefits of Cesarean versus Vaginal versus Operate Vaginal Delivery.

As Mrs. Zhao's labor progressed, Dr. Cruz should have recognized signs of cephalopelvic disproportion. Even Dr. Cruz testified that the baby's macrosomia would explain Mrs. Zhao's exhaustion after an hour and a half of pushing. Given the length of Mrs. Zhao's second stage of labor, and given the macrosomia risk factors Dr. Cruz should have appreciated during Mrs. Zhao's prenatal care, the standard of care required Dr. Cruz to recommended a Cesarean section during labor.

Dr. Cruz testified that he did offer Mrs. Zhao a Cesarean section. Even assuming this is true, and even assuming that Mrs. Zhao comprehended the Cesarean section option (which seems unlikely given her exhaustion and that accurate translation of Dr. Cruz's message was dubious by virtue of the competing translators), Dr. Cruz's supposed Cesarean section offer was insufficient. Mrs. Zhao felt she could no longer push. Dr. Cruz first offered to assist her vaginal delivery with a vacuum device and then gave the option of surgery. As for risks and benefits of the respective delivery methods, the only risk factor of vacuum-assisted delivery Dr. Cruz relayed was the risk that the suction might damage the baby's head or brain. There was no mention of "macrosomia" or "shoulder dystocia" or "brachial plexus injury."

Dr. Cruz's care fell below the standard of care when he did not inform Mrs. Zhao that use of the vacuum device for continued vaginal labor and delivery increased the risk of shoulder dystocia. It is undisputed that Dr. Cruz did not tell Mrs. Zhao what shoulder dystocia was, much less describe a brachial plexus injury. Dr. Cruz himself admitted that

had he performed an ultrasound indicating a 10.5- to 12.5-pound baby he would have had the responsibility to inform Mrs. Zhao she was at increased risk for shoulder dystocia and that her baby was at increased risk of permanent brachial plexus injury (Doc. 51, pp. 558-60). Dr. Cruz did not inform Mrs. Zhao of any risks in proceeding with vacuum assisted vaginal birth as related to delivery of a large, macrosomic baby.

Suspected macrosomia would have fundamentally changed the substance and tenor of Dr. Cruz's "offer" of a Cesarean section. Of course, Dr. Cruz needed to suspect macrosomia in the first place, which he inexplicably did not. As it was, Mrs. Zhao's purported "choice" of vacuum assisted vaginal delivery was wholly uninformed.

4. Negligent Utilization of Vacuum Extractor.

Dr. Cruz failed to recognize the macrosomia and cephalopelvic disproportion. He proceeded with vacuum extraction even though macrosomia and cephalopelvic disproportion contraindicate vacuum extraction. It was certainly foreseeable that this large baby's shoulders would get jammed inside his mother's pelvis when Dr. Cruz forced the baby into a too-tight space by using a vacuum to suck the baby's head through.

Dr. Cruz admitted that at the time he applied the vacuum, the baby's head was not at an outlet station (Doc. 46, p. 115). If the head had truly been down to the outlet, crowning, the vacuum extraction would not have been necessary. Instead, the evidence in this case is that the head was not ready to deliver—and despite all signs pointing to a macrosomic baby—Dr. Cruz proceeded to vacuum suction the baby's head out, and in the process, he caused the impaction of Steven's shoulders.

Finally, the Court discounts Dr. Gherman's opinion that Dr. Cruz was not obligated to proceed judiciously (if at all) with vacuum extraction because Steven's head was "essentially out or at least at an outlet station" when Dr. Cruz applied the vacuum (Doc. 47, p. 332). In Dr. Gherman's opinion, because Steven's head was at an outlet station, Dr. Cruz's actions could not have caused or contributed to the shoulder dystocia (Id. at p. 225). But Dr. Gherman's only evidence that Steven was at an outlet station when Dr. Cruz applied the vacuum to Steven's head was Mrs. Zhao's deposition testimony that she could see the hair of Steven's head crowning before Dr. Cruz applied the vacuum (Id. at pp. 224-26; Ex. 201, p. 4). When asked to assume that Dr. Cruz testified that Steven's head was *not* at an outlet station at the time Dr. Cruz applied the vacuum extraction, Dr. Gherman quibbled that Mrs. Zhao and the interpreter might have had a better view of the fetal vertex station than Dr. Cruz (Doc. 47, pp. 333-35). Dr. Gherman's opinion on this issue makes no sense to the Court.

5. Failure to Perform an Episiotomy of Proctoepisiotomy.

Once the shoulders were impacted, there was no space in the vagina for Dr. Cruz to reach in and successfully maneuver the eleven-pound six-ounce baby to relieve the dystocia. When Dr. Jones arrived in response to the emergency call, she was able to fit her hand, smaller than Dr. Cruz's hand, inside the vagina. Not only that, she had room to move her hand and successfully manipulate the baby's shoulders so that she and Dr. Cruz could deliver the rest of the body.

Because the space was so tight, Dr. Cruz was unable to grasp the baby's posterior arm as necessary. An episiotomy or proctoepisiotomy was indicated in order to make more room and relieve the dystocia in a more timely manner.

6. Negligent Exertion of Excess Traction on Steven's Head.

Steven's shoulder dystocia lasted for *nine minutes*. There can be no question that as the seconds and minutes ticked by, Dr. Cruz's nerves increased. Dr. Cruz himself testified that it was possible he had exerted too much traction on the baby's head, thereby causing the brachial plexus injury (Doc. 47, pp. 168-71). Given the length of time of the dystocia, the four times Dr. Cruz pulled on the head during the dystocia,[15] and Dr. Cruz's own testimony, the Court finds that more probably than not, Dr. Cruz negligently pulled Steven's head with too much force.

Causation

Under Illinois law, to establish proximate cause in a medical malpractice case, a plaintiff must show cause-in-fact and legal cause. *Morisch v. United States,* 653 F.3d 522, 531 (7th Cir. 2011), *quoting Bergman v. Kelsy,* 873 N.E.2d 486, 500 (Ill. App. Ct. 2007). "Cause in fact exists when there is a reasonable certainty that a defendant's acts caused the injury or damage." *Morisch,* 653 F.3d at 531 (quoting *Coole v. Cent. Area Recycling,* 893 N.E.2d 303, 310 (Ill. App. Ct. 2008)). Legal cause exists when "an injury was foreseeable as the type of harm that a reasonable person would expect to see as a likely result of his

[15] Dr. Cruz admitted he pulled on Steven's head during the initial attempt to deliver, during the McRoberts' maneuver, during the attempted Woods' maneuver, and when he finally pulled the baby out by his head (Doc. 47, p. 164).

or her conduct." *Id. quoting LaSalle Bank, N.A. v. C/HCA Devel. Corp.,* 893 N.E.2d 949, 970 (Ill. App. Ct. 2008).

There is a plethora of evidence in the record that Dr. Cruz's negligence caused Steven's shoulder dystocia. Mrs. Zhao had multiple risk factors for a macrosomic birth, and Dr. Cruz failed to use the appropriate tools to estimate fetal weight. He also failed to describe the risks of shoulder dystocia and brachial plexus injury during the birth of a macrosomic baby when he offered a Cesarean section to Mrs. Zhao either before labor or during labor (assuming he did). And then Dr. Cruz vacuumed the head of a macrosomic baby out when vacuum extraction was contraindicated—contraindicated precisely because of the probability that the shoulders would be stuck after impacting the bony structures of the pelvis. Even were the Court to give Dr. Gherman's opinion full credit, Dr. Cruz caused the shoulder dystocia and the brachial plexus injury. Dr. Gherman opined that "the shoulder dystocia itself," the impact of the shoulders, was the cause of the brachial plexus injury. But the Court does not adopt Dr. Gherman's opinions. The far more persuasive evidence demonstrates that, in addition to missing the undisguised probability of macrosomia, shoulder dystocia, and brachial plexus injury, Dr. Cruz exerted excess traction on Steven's head. Steven's nerve roots were stretched and avulsed, *i.e.*, ripped out. The expert testimony of Dr. Cardwell convincingly establishes that the shoulder dystocia and resultant brachial plexus injury were foreseeable consequences of Dr. Cruz's negligent acts and omissions. Steven's injury could have been avoided if Dr. Cruz would have simply "measured twice" and "cut once."

Damages

In consideration of all the findings and conclusions detailed above, in addition to the evidence heard at trial and otherwise submitted by the parties, the Court finds in favor of Yong Juan Zhao, as parent and natural guardian of Steven Zhao, a minor, and against the United States as follows:

1. Past Medical Expenses.

Steven has incurred substantial medical and surgical costs to date. Including his stay in the neonatal intensive care unit and the nerve graft surgery, Steven's medical bills to-date total $64,967.77 (Ex. 38). The United States has not objected to the propriety of any charges. The Court finds the bills totaling **$64,967.77** fair, reasonable, customary, and medically necessary for treatment of Steven's brachial plexus injuries.

2. Future Medical Expenses.

Statistically, Steven can be estimated to live to seventy-three years of age (Ex. 32). His treating physician, Dr. Noetzel, established that he will require lifetime follow-up care from a physiatrist and physical/occupational therapists. And, of course, the longest he might possibly expect to receive physical therapy services through the school system is twenty-two years old.

Steven also will need to be followed by an orthopedist throughout his life, and more likely than not, he will require orthopedic surgery to relieve increasing shoulder tightness. That orthopedic surgery will, according to Dr. Noetzel, probably be necessary at some time before Steven is eight years old (just a few years from now). Contrary to the Government's assertion that the record is "devoid of *any* evidence concerning the

potential cost of that surgery," the Court notes that the cost of Steven's previous surgery, including preliminary evaluations and follow-up, totaled approximately $47,000. Particularly given the relatively imminent need for major surgery, and for all the reasons stated in his report, the Court adopts the total offset present value calculation detailed by Mrs. Zhao's expert David Gibson. Notably, the United States did not object to this net neutral discount approach.

Finally, the occupational and physical therapy treatment Steven received at St. Louis Children's Hospital conservatively averaged $150 per session. If Steven were to follow-up with a therapist once every three months from age twenty-two until age seventy-three, those future medical costs would be $30,600.

Thus, Using Steven's previous surgery as the benchmark for estimating costs of his future surgery, and conservatively approximating costs of therapy as described above, future surgery would cost $77,600. This figure is hardly comprehensive given the evidence of Steven's future physiatry, orthopedic, and therapeutic needs caused by his brachial plexus injury. Thus, the Court finds an award of **$80,000** in future medical costs warranted.

3. Lost Earning Capacity.

Mr. Gibson, Mrs. Zhao's vocational economics expert, estimates that because of his physical injury, Steven will sustain a loss of earning capacity in a range of $916,793 to $1,581,779. On the other hand, the Government's expert Susan Entenberg does not believe that Steven's injury will cause him to lose any income whatsoever.

Based on the evidence, the Court finds by a preponderance of the evidence that Steven's injury will impact his earning capacity. Determining that lost earning capacity is difficult, however, because at his young age it is impossible to predict how far Steven will go in school. Even Ms. Entenberg acknowledged that Steven's lost earning capacity as a high school graduate is significant because his disability prevents him from trade employment. She noted, however, that Steven's ability to speak both Mandarin Chinese and English will be an asset in the labor market (Ex. 203, p. 2), and the Court agrees that is likely. Ms. Entenberg testified that if Steven were able-bodied, he could apply himself to a union operating or engineering trade, earning in excess of $100,000 per year. Unfortunately, however, Steven can never enter those professions, because of his disability. Ms. Entenberg testified that as a high school graduate, Steven could possibly expect to make $20,000 to $30,000 a year in an unskilled job like a cashier or payroll clerk.

Thus, the differential between what Steven could have expected to make every year as a high school graduate with and without his injury is $70,000. Mr. Gibson calculated the amount of time Steven would likely have been in the workforce as a high school graduate if he had not been disabled—37.9 years (Ms. Entenberg did not calculate worklife expectancy). A loss of $70,000 a year over 37.9 years is a loss of **$2,653,000**. The Court finds this sum best approximates Steven's lifetime lost wages caused by the brachial plexus injury.

4. Disfigurement.

In Illinois, damages for disfigurement are distinct from other facets of damage, such as disability. *Antol v. Chavez-Pereda*, 672 N.E.2d 320, 327 (Ill. App. Ct. 1996). To

"disfigure" means "to make less complete, perfect, or beautiful in appearance." *Holston v. Sisters of the Third Order of St. Francis,* 650 N.E.2d 985, 997 (Ill. 1995).

The Court observed that Steven's right arm and hand are smaller than his left. He seems to hold the right arm close to his body as though to protect it, and the disfigurement is noticeable. The discrepant size of his right arm and hand will only increase as Steven grows older. When Steven goes through the growth spurt associated with puberty, the disfigurement of his right arm and hand will be particularly noticeable. Unfortunately, Steven can't disguise his disfigured arm with long sleeves because the disfigurement extends to the awkward way Steven will hold and utilize his right arm. Dr. Noetzel testified about the increasingly observable arrested movement. Dr. Noetzel testified that Steven's right arm and hand will differ from his left not only in muscle size, but in the bones themselves. For the rest of his life it will be an obviously shrunken, shortened, damaged extremity. For the permanent disfigurement of his right shoulder, right arm, and right hand, Steven is entitled to damages in the amount of **$1,500,000**.

5. Loss of a Normal Life.

Fortunately, Steven's abilities with his right arm and hand improved following the nerve grafting surgery. But the evidence establishes that Steven's progress will quickly plateau.

Steven's occupational therapist, Cara Ellis, began treating Steven when he was around three years old. In the past year, Ms. Ellis has evaluated Steven once, and observed him on four other occasions in a supervisory capacity while he treated with assistant therapists. Ms. Ellis testified Steven has shown improvement and is able to

perform age-appropriate tasks like swinging on a swingset with two hands, climbing the slide, propelling himself on a scooter board, and opening packages of crackers. Although Ms. Ellis testified Steven's right arm is "functional for school-related tasks," she admits there are several unknowns about his future abilities. Moreover, Steven's problems mostly pertain to the strength in his right arm, and Ms. Ellis has been unable perform a manual muscle test to fully assess his functioning.

The Court finds Ms. Ellis's opinions are useful in understanding Steven's current abilities, but these opinions are—admittedly—not a reliable indicator of Steven's struggles ahead. Dr. Noetzel, on the other hand, has been involved in Steven's treatment since Steven was one month old, and he has performed a variety of tests throughout the years to assess Steven's muscle strength and range of motion. Dr. Noetzel has a comprehensive grasp on Steven's progress and believes Steven's injuries will impede most physical activities and activities of daily living. Specifically, Steven will never have full range of motion or full strength in his right shoulder, arm, or hand. He will always need to choose activities, including extracurricular activities strategically. More likely than not he will watch his school sports teams from the sidelines. Pastimes that require bilateral or independent right hand grip strength will always be challenging if not impossible—he will likely struggle to hold a video game controller or a golf club or a baseball or a musical instrument with his right hand, much less effectively use those items. Dr. Noetzel testified that Steven won't be able to rebound a basketball. Mrs. Zhao testified that Steven struggles to press down piano keys with the fingers of his right hand. She testified that Steven could not hold a cup in his right hand without assistance.

Dr. Noetzel questioned whether Steven will be able to safely drive independently. Steven's brachial plexus injury automatically limits his ability to pursue certain jobs and vocations. Even defense expert Susan Entenberg admitted that Steven will never be able to perform manual labor occupations requiring medium to heavy categories of exertion. While he may be capable of becoming proficient with the use of computers, he will need to rely on technology to assist him, such as voice to text and adaptive keyboards.

As Steven's parents age, and as Steven ages-out of school assistive services, his functional challenges will increase. Steven will need to find adaptations for anything that would otherwise require independent use of the right arm and hand. Even if he finds adaptations, he will likely complete activities of daily living at a noticeably slower pace. His disability will impede mundane tasks like brushing his teeth. As for consequential life decisions, like choice of a career, his disability makes certain options impossible. Every single day for the rest of his life, Steven will be limited by his brachial plexus injury.

The United States argues that damages for loss of a normal life are not recoverable, because Steven's condition was suffered at birth, and therefore there is no change in lifestyle attributable to his injury, citing *Jones v. Chicago Osteopathic Hosp.*, 738 N.E.2d 542, 554 (Ill. App. Ct. 2000). But *Jones* does not stand for that proposition. In *Jones*, the damages instruction included both "disability" and "loss of a normal life." The appellate court found the trial court erred because loss of normal life "has almost universally been interpreted as a component of disability . . ." While the court suggested one cannot experience loss of normal life if he experienced the injury at birth, the court stated,

"Whether 'lifestyle change' is a necessary element of a loss of normal life instruction is something we need not decide in this case."

Here, there is little doubt that because of Dr. Cruz's negligence, Steven's potential lifestyle was forever changed. The Illinois pattern jury instructions define "loss of a normal life" as "the temporary or permanent diminished ability to enjoy life. This includes a person's inability to pursue the pleasurable aspects of life." I.P.I. 30.04.02. The Court has no doubt that there are aspects of Steven's life that will be enjoyed less or not pursued at all because of his injury.

For the deprivation of a normal life, Steven is entitled to damages in the amount of **$2,000,000**.

6. Pain and Suffering, Emotional Distress.

Steven is now five years old. According to Mrs. Zhao, he has already verbalized a wish for a "normal" arm. She recounted Steven trying to dance around with his older brother Benjamin. He could not move his right arm the way Benjamin could. Steven told his mother, "I want Benjamin's arm."

As mentioned above, Steven's parents are Chinese first-generation residents in the United States. The family travels back to China for visits with relatives. Steven will likely learn that in Chinese culture, as explained by Mrs. Zhao, people discourage children from using their left hand. Mrs. Zhao testified that if a child is seen using his left hand to use chopsticks, for example, someone may hit the child's left hand with the chopsticks to discourage him. Chinese characters are written with the right hand, and Mrs. Zhao doubts Steven will be able to successfully write Chinese. Steven's inability to adhere to

certain cultural norms or fully participate in traditional Chinese customs will likely be a source of distress.

Mrs. Zhao testified that Steven gets upset because he sees that his arm is different than his classmates' arms. As Steven gets older and his disfigurement becomes more and more noticeable, comparison to his peers will likely be more upsetting. And, as his occupational therapist Clara Ellis noted, kids can be mean, especially in junior high and high school.

Steven will be fully aware, probably hyper-aware, of what he cannot do because of his injury. Every time he is unable to join in a basketball game with his friends; every time he has to enlist the help of his left hand to reach up and brush his hair, or to eat, or to dress; every time he notices a stranger or new acquaintance do a double-take when they see his right arm, he will suffer some amount of emotional distress. No matter how adapted or otherwise-happy Steven is, for the rest of his life he will live with a right arm that is not normal. For the distress he has experienced and will experience every day of his life, Steven is entitled to damages in the amount of **$2,000,000**.

Total Damages

Past Medical Expenses	$64,967.77
Future Medical Expenses (present value)	$80,000.00
Future Lost Earnings (present value)	$2,653,000.00
Disfigurement	$1,500,000.00
Loss of a Normal Life	$2,000,000.00
Pain, Suffering, Emotional Distress	$2,000,000.00
	$ 8,297,967.77

In reaching each of the itemized damages listed above, the Court considered, and connected to each item of damage, the facts and evidence presented to the Court during the bench trial in this matter. The Court has likewise compared these damages, particularly the non-pecuniary damages, to damages in factually similar brachial plexus injury cases, and these damages are in line with other cases.

For example, in another malpractice case arising and tried in Illinois, *Skonieczy His Parents and Next Friends et al. v. Philip M. Gardner, M.D., et al.,* an Illinois Circuit Court awarded the plaintiff $13.298 million[16] for injuries to his brachial plexus he suffered due to shoulder dystocia. In that case, the defendant's negligence was likewise found to have caused brachial plexus injury secondary to shoulder dystocia. Before the plaintiff's birth in that case, his mother delivered one other child, who weighed seven pounds, ten ounces and posed difficulties during labor "similar to those encountered by the defendants during the birth of the plaintiff." But the first-born child did not suffer any injuries. The mother testified she visited her doctor a day before delivering the plaintiff child, and the doctor estimated the baby weighed 9.5 pounds. The mother expressed concern to her doctor about the size of the baby, given her difficulties giving birth the first time, but the doctor did not investigate the circumstances of the first birth any further.

The next day, the doctor encountered shoulder dystocia while delivering the baby, and had to apply a vacuum extraction. The baby suffered brachial plexus so devastating that four nerve roots were avulsed from his spinal cord. At the time of the trial, the baby

[16] The breakdown of those damages is as follows: lost future earnings = $225,000; pain and suffering = $3,000,000; disability = $5,000,000, and disfigurement = $4,000,000. *Skonieczny v. Gardner, M.D.*, 98L4578, 2001 WL 36512978 (Ill. Cir. Ct. 2001).

had already undergone numerous surgeries and physicians testified he would develop worsening scoliosis as he grew. The plaintiff's treating physicians also testified he would likely suffer permanent incurable neuropathic pain from the trauma, would have little ability to use the affected arm and shoulder, and would be significantly limited in the types of work he could perform. Also, the growth in the plaintiff's arm was obviously stunted.

The United States argues that in this case, there is no evidence of pain and suffering or emotional distress; Steven is not entitled to damages for loss of a normal life because his condition occurred at birth, so there are no life changes attributable to his injury; there is no evidence of loss of future earning capacity; Steven is not disfigured; and there is no evidence of necessary future medical care. In other words, according to the United States, Steven is only entitled to recover his past medical expenses.

To the contrary, the Court notes that the injury in the *Skonieczny* case is remarkably similar to Steven's and acknowledges that the *Skonieczny* case was decided eighteen years ago. In light of the evidence presented at trial, Steven has undoubtedly suffered pain in the past and will in the future, and he certainly will experience life changes because of his injury. The Court itself noted disfigurement, and all damages claimed by Mrs. Zhao on behalf of Steven are supported by expert testimony.

In a more recent case, damages in the amount of $60,939,847 were awarded to a minor plaintiff with brachial plexus injury secondary to shoulder dystocia. *Swanson v. Northern Westchester Hosp. Center,* No. 16743/07, 2009 WL 5909193 (Dec. 10, 2009). In *Swanson,* the defendant doctor negligently managed shoulder dystocia causing brachial

plexus injury to the baby, Michael. *Id.* In addition to a damaged arm and shoulder, Michael suffered brain damage and permanent cognitive disability secondary to the excessive traction applied at birth. *Id.* Fortunately, in Steven's case, there is no evidence of cognitive impairment.

The United States urges the Court to consider damages in other similar cases, in the event the Court finds that Steven is entitled to recover damages at all, which it has. For instance, in *P.B. v. Rush-Copley Medical Center, Inc.*, JVR No. 1307310021, 2013 WL 3972275 (Ill. Cir. Ct. 2013), the parties settled for $1.5 million. In that case, the plaintiff alleged the doctor improperly monitored the mother during the final stages of pregnancy and labor, improperly read and interpreted fetal heart monitoring strips, failed to inform the mother of the risks of macrosomic births, decided to perform a vaginal birth rather than a Cesarean section, and performed improper techniques to help deliver the baby. The doctor also utilized vacuum delivery and fundal pressure after encountering shoulder dystocia. The child was thirteen years old at the time of the settlement.

Unfortunately, precise details about the damages in the *P.B.* case are not available.[17] In addition, this case is not particularly helpful because it involved a settlement, which, of course, factors in risk components on both sides and does not necessarily establish that the standard of care was breached and that all elements of

[17] Similarly, in addition to the cases discussed below, the Court reviewed the other settlements the United States points to as comparable value, including *Pitman v. Galen Hospital*, 97-L-1225, 2001 WL 36506122 (Ill. Cir. Ct. 2001), *Doe v. Waters*, 99L4680, 2003 WL 26458492 (Ill. Cir. Ct. 2003), *Gabr v. Druhan*, 05 LK 138, 2007 WL 3119465 (Ill. Cir. Ct. 2007), *McGee v. Brill*, 04L14283, 2008 WL 9355819 (Ill. Cir. Ct. 2008), and *A.H. v. Uppuluri*, 2010-L-000015, 2014 WL 2700979 (Ill. Cir. Ct. 2014). The Court also on its own reviewed the cases of *Burnett v. West Suburban Medical Center*, 1999 WL 34544865 (Ill. 1999), and *Lawson v. Levie, M.D.; St. Francis Hospital and Health Center*, 01 L 13146, 2001 WL 35115389 (Ill. 2001). Again, the settlement value of these case is not particularly helpful, and the Court notes that with the exception of the *A.H.* case, each reported settlement is more than ten years old.

damages were recovered.

> [S]ubstantial benefits may be gained by resolving lawsuits by compromise instead of a winner-take-all resolution on the merits. Litigation . . . can produce disastrous results for the loser or a pyrrhic victory for the winners . . . By contrast, a settlement allows parties to resolve their dispute by compromise, taking into consideration all relevant risks and costs. In settlement, each side gives up something: a plaintiff foregoes the opportunity to recover the maximum award achievable through a jury trial, and a defendant foregoes the chance to obtain vindication . . . that it could achieve with a victory at trial."

Pesek v. Donahue, No. 04 C 4525, 2006 WL 1049969, at *4 (N.D. Ill. Feb. 9, 2006). "The essence of settlement is compromise. Each side gains the benefit of immediate resolution of the litigation and some measure of vindication for its position while foregoing the opportunity to achieve an unmitigated victory." *E.E.O.C. v. Hiram Walker & Sons, Inc.*, 768 F.2d 884, 889 (7th Cir. 1985).

The Court considered the following reported verdicts: In 2003, an Illinois jury awarded a plaintiff $1.28 million where the plaintiff mother alleged the doctor applied excessive force and was negligent in the delivery of her baby, which caused injury to the baby's brachial plexus. Unfortunately, there is little information available about that case, *Hawkins v. Zimmerman*, 01L621, 2003 WL 25138107 (Ill. Cir. Ct. 2003). The jury's award included $89,132 in past medical expenses and $250,000 in future wages.

In *M.R. v. Starr*, 05 L 14640, 2010 WL 4652392 (Ill. Cir. Ct. 2010), a jury awarded $3.27 million to a mother who gave birth to the plaintiff child in 2002. The mother had multiple risk factors for fetal macrosomia, including excessive maternal weight prior to pregnancy, a small stature and Hispanic ethnicity, and weight gain during pregnancy. The mother had an ultrasound, which failed to provide an estimate of fetal weight

because the mother's pelvis was not visualized. The doctor viewed the ultrasound but did not recommend a follow-up ultrasound. The plaintiff child's birth was complicated by shoulder dystocia, and he suffered injuries to his brachial plexus. The mother alleged the doctor failed to recommend or initiate Cesarean delivery and applied excessive lateral traction on the brachial plexus at the time of delivery. A jury found in favor of the plaintiff and awarded him $225,000 for past and future medical expenses; $363,250 for disfigurement; $1.677 million for past and future disability; $754,650 for past and future pain and suffering; $200,000 for future educational expenses; and $50,000 for future lost wages.

The United States points to the case of *C.C. v. Thaker*, 05 L 160, 2008 WL 3875368 (Ill. Cir. Ct. 2008), where are jury awarded a plaintiff, who was born macrosomic, $2.3 million. In that case, a doctor applied excessive force during the plaintiff's delivery, which resulted in permanent injuries to her brachial plexus. There is little information about this case, but the jury awarded $750,000 for future medical expenses, $500,000 for disfigurement, $500,000 for past and future loss of a normal life, $250,000 for past and future pain and suffering, $250,000 for lost earnings upon becoming an adult and $101,517.76 for past medical expenses.

In 2010, an Illinois jury awarded a plaintiff child—who was born in 2000—$1 million. In that case, *J.K. v. Rush Univ. Med. Ctr.*, 07 L 284, 2010 WL 4358541 (Ill. Cir. Ct. 2010), the plaintiff child sustained injury to the C5 and C6 nerves of the brachial plexus of his right arm. A jury returned a verdict for the plaintiff, finding that the doctor failed to timely assess or recommend a Cesarean section; failed to anticipate the shoulder

dystocia, based on maternal risk factors; inappropriately used a vacuum to deliver the child; and failed to use appropriate techniques during the delivering. Specifically, the jury awarded $350,000 for disfigurement, $50,000 for past and future disability, $250,000 for past and future pain and suffering and $350,000 for past and future medical expenses.

In a more recent case, *M.V. v. McMahon*, 2010-L-002905, 2016 WL 4773196 (Ill. Cir. Ct. 2016), a jury awarded $2.8 million to a plaintiff child who was born in 2007. Similar to Steven's case, in that case, the doctor failed to provide prenatal ultrasounds or offer a Cesarean section; improperly performed medical techniques that would have aided the process of the birth; and used excessive force during the delivery. The jury awarded $650,000 in pain and suffering; $114,338 in past medical; $150,000 in future medical; $750,000 in future wages; and $1,150,00 in "other."

In *O.L. v. Akere*, 2013-L-001645, 2017 WL 2402859 (Ill. Cir. Ct. 2017), a jury awarded the injured plaintiff $2 million. In that case, the doctor failed to get an ultrasound prior to birth and failed to get consent from the mother to use the vacuum to assist the birth of the child. Also, the doctor used excessive lateral force when trying to address the shoulder dystocia which caused the brachial plexus injury. The doctor also failed to follow medical techniques to assist in fixing this situation and did not offer a Cesarean section. The jury awarded $500,000 in pain and suffering; $400,000 in past medical; $350,000 in future wages; and $750,000 in "other" damages.

When considering this limited information gathered from other cases, the Court concludes that the above awarded damages to Mrs. Zhao on behalf of Steven are supported by the evidence, reasonable, and justified.

CONCLUSION

For the reasons set forth above, the Clerk of Court is **DIRECTED** to enter judgment in favor of Yong Juan Zhao, as Parent and Natural Guardian of Steven Zhao, a minor, and against the United States, in the amount of **$8,297,967.77**. Mrs. Zhao is further awarded her costs.

IT IS SO ORDERED.

DATED: August 22, 2019

NANCY J. ROSENSTENGEL
Chief U.S. District Judge